

Staff Memorandum



To	Mayor A. Nuttall and Members of Council
Subject	Battery Electric Bus (BEB) Pilot and Testing
Date	February 4, 2026
Ward	All
From	B. Forsyth, Director of Transit and Parking Strategy
Executive Member Approval	R. James-Reid, General Manager of Access Barrie
CAO Approval	M. Prowse, Chief Administrative Officer

The purpose of this memorandum is to provide members of Council with an update concerning the pilot of two (2) Battery Electric Bus (BEB). During this pilot program City staff will be gathering metrics and KPI's for a 12-month period and provide regular updates to Council. This memo is for the testing completed thus far for the Fall (September – November) of 2025.

City staff have collaborated with the Operating Contractor to complete the fall phase of testing the BEB's. From September 1st to September 12th, City Staff established a baseline measurement, where the BEB operated in the Transit Network with no passengers and stops made on 50% of the designated bus stops.

From September 15th through to November 30th, the BEB's went into standard full service in the Transit Network. In this phase of the testing, BEB's were operating in normal passenger load and weather conditions for the Fall season.

Performance data are summarized as follows:

	September (Baseline)	September	October	November
Mileage (km/kWh)	1.14	1.10	0.92	0.99
Regenerative Braking Ratio*	0.41	0.40	0.40	0.34
Estimate Range (km)	339	330	272	254
Average Passenger Load	0	13	13	14
* Regenerative Braking Ratio = Regenerative Energy /BEB Energy Consumption				

Table 1. BEB - Fall operational performance

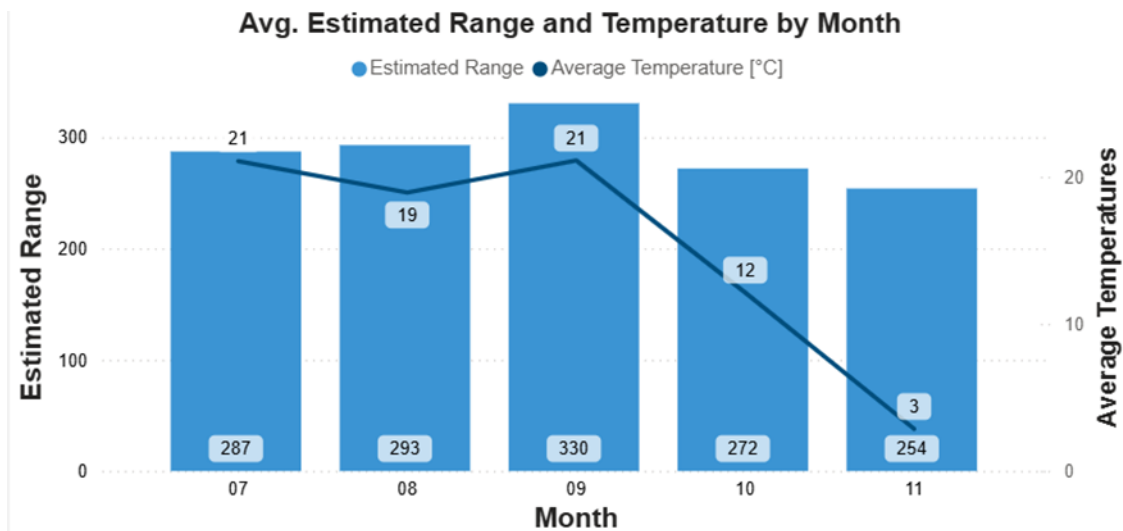


Figure 1. Estimated Range by Month and Temperature

	Summer*	Fall*
Mileage (km/kWh)	0.98	0.96
Regenerative Braking Ratio**	0.38	0.37
Estimate Range (km)	290	285
Average Passenger Load	16	13
Average Ambient Temperature (°C)	20	12
*Excludes Baseline Data		
** Regenerative Braking Ratio = Regenerative Energy /BEB Energy Consumption		

Table 2. BEB - Summer versus Fall Operational Performance

On average, the BEB range measured approximately 290 km during Summer phase, compared to 285 km during the Fall testing phase. For reference, the City's diesel buses travel up to 400km for a full day of service.

City staff observed this modest decrease in vehicle range between the Summer and Fall testing periods, despite comparable regenerative braking performance and slightly lower overall passenger loads. This indicates that operator driving patterns remained generally consistent and that the reduction in vehicle weight (i.e. reduced passenger loads) did not offset the impact of seasonal weather conditions.

City staff hypothesize that the main factor affecting vehicle range was lower average temperatures during the Fall testing period, approximately 12°C, compared to 20°C in the Summer. The BEB required more energy to maintain cabin temperatures, and in turn reduced BEB range. As the City enters the deep Winter months, City staff will obtain further clarity regarding BEB performance as it relates to weather conditions.

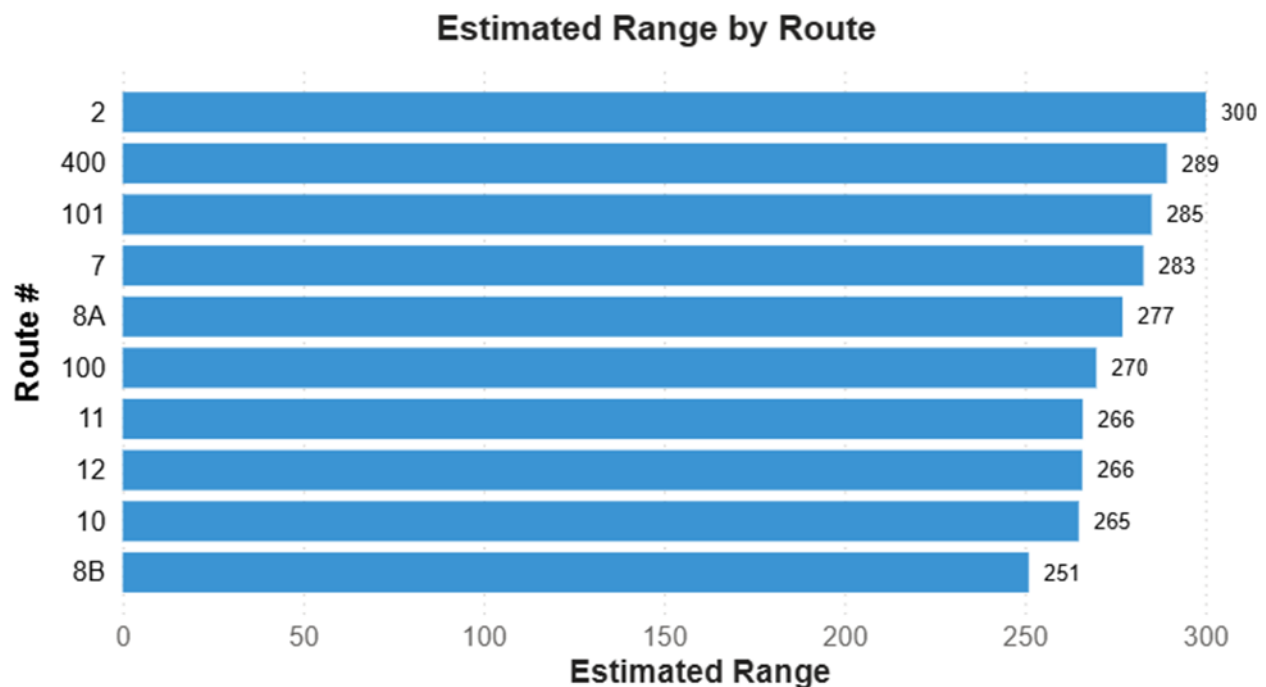


Figure 2. Estimated Range by Route Number

City staff consolidated the data (which contains both Summer and Fall data) and assessed the estimated range on a per-route basis. The analysis indicates that the estimated operating range is approximately 251–300 km. City staff attribute variations within this range to factors such as the number of stops, passenger loads, and geographic conditions. Further data collection and analysis would help City staff to better understand these variations.

City Staff also compared the fuel and energy dollar cost per kilometre of a conventional 40' diesel bus versus the 40' BEB's. Overall the average, inclusive of both Summer and Fall, for diesel buses cost \$0.43/km while BEB's cost \$0.32/km

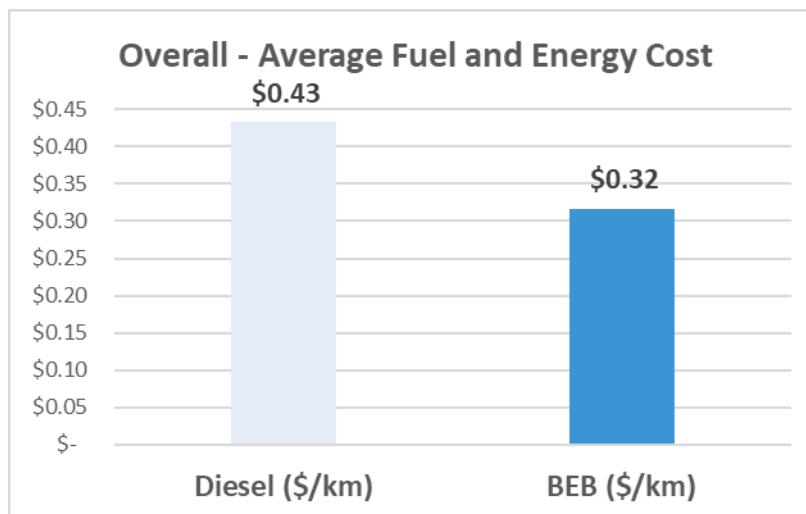


Figure 3. Overall Fall Average Fuel and Energy Cost

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File #:

Pending #: Not Applicable